AMENDMENTS TO THE CLAIMS

1-62. (Cancelled)

63. (Currently Amended) A method of obtaining tropospheric delay data for use in increasing the accuracy with which the location of a receiver in a global navigation satellite system (GNSS) can be determined, the method comprising the steps of:

generating a first set of approximate tropospheric delay values applicable to various receiver geographical locations from a first model at a location remote from
said receiver;

generating a second set of accurate tropospheric delay values applicable to said various receiver geographical locations from a second ~~meteorological~~ model, which is a meteorological model, at a location remote from said receiver;

developing a set of tropospheric delay value modifications applicable to said first model so that together, said first model and said tropospheric delay value modifications can provide a set of tropospheric delay values substantially in agreement with said second set of accurate tropospheric delay values; and

communicating said set of tropospheric delay value modifications to said receiver.

64. (Previously Presented) A method according to claim 63 wherein the first model is based on non-meteorological parameters.

65. (Previously Presented) A method according to claim 64 wherein said non-meteorological parameters comprise at least one of time of year, latitude and altitude.

66. (Previously Presented) A method according to claim 65 wherein said non-meteorological parameters comprise at least one of longitude and time of day.

67. (Previously Presented) A method according to claim 63 wherein said sets of tropospheric delay values comprise zenith tropospheric delay values.

68. (Previously Presented) A method according to claim 64 wherein said sets of tropospheric delay values comprise zenith tropospheric delay values.

69. (Previously Presented) A method according to claim 65 wherein said sets of tropospheric delay values comprise zenith tropospheric delay values.

70. (Previously Presented) A method according to claim 66 wherein said sets of tropospheric delay values comprise zenith tropospheric delay values.

71. (Previously Presented) A method according to claim 67 wherein the first model contains a mapping function relating tropospheric delay values at a given elevation angle to the zenith tropospheric delay values.

72. (Previously Presented) A method according to claim 71 wherein said set of tropospheric delay value modifications comprises a set of modifications for use with the mapping function of the first model.

73. (Previously Presented) A method according to claim 63 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

74. (Previously Presented) A method according to claim 64 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

75. (Previously Presented) A method according to claim 65 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

76. (Previously Presented) A method according to claim 66 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

77. (Previously Presented) A method according to claim 67 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

78. (Previously Presented) A method according to claim 68 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

79. (Previously Presented) A method according to claim 69 wherein the delay value modifications are the differences between corresponding values of:

the first set of approximate tropospheric delay values attributable to the first model; and

the second set of accurate tropospheric delay values attributable to the second meteorological model.

80. (Currently Amended) A method according to claim 73 in which the delay value modifications are expressed as a ~~fractinal~~ fractional change from the values of the first set of tropospheric delay values.

81. (Currently Amended) A method according to ~~anyone of~~ claim[[s]] 63 ~~to 79~~ wherein the set of delay value modifications is expressed as a data array, each modification having a value which is determined for an individual grid point on at least a part of the earth's surface.

82. (Previously Presented) A method according to claim 81 wherein said set of modifications is expressed as a digital data file.

83. (Previously Presented) A method according to claim 82 wherein said digital data file is a greyscale image of multi-bit words, each word representing a location of the region.

84. (Previously Presented) A method according to claim 83 comprising the further steps of applying data reduction to the set of tropospheric delay value modifications to derive a reduced set of tropospheric delay value modifications for communication to a user.

85. (Previously Presented) A method according to claim 84 wherein the data reduction is an image compression process.

86. (Previously Presented) A method according to claim 84 comprising reducing the data size by lossy data reduction.

87. (Currently Amended) A method according to claim [[8S]]85 comprising reducing the data size by lossy data reduction.

88. (Previously Presented) A method according to claim 86 comprising effecting data reduction by reducing the correction set data file according to a JPEG 2000 or JPEG 90 standard.

89. (Currently Amended) A method according to ~~any preceding~~ claim 63 wherein said accurate tropospheric delay values are derived by a ray tracing technique.

90. (Previously Presented) A method according to claim 89 wherein said accurate tropospheric delay values are derived by three-dimensional refractive index field generation.

91. (Currently Amended) A method according to ~~any preceding~~ claim 63 wherein said meteorological model is based on numerical weather prediction (NWP) data for a region of the earth.

92. (Previously Presented) A method according to claim 89 wherein said meteorological model or each said tropospheric delay value modification is augmented by directly observed meteorological data.

93. (Previously Presented) A method according to claim 90 wherein said meteorological model or each said tropospheric delay value modification is augmented by directly observed meteorological data.

94. (Previously Presented) A method according to claim 91 wherein said meteorological model or each said tropospheric delay value modification is augmented by directly observed meteorological data.

95. (Previously Presented) A method according to claim 92 wherein said meteorological model or each said tropospheric delay value modification is augmented by directly observed meteorological data.

96. (Previously Presented) A method according to claim 92 wherein said directly observed meteorological data is derived as a data set relating to a region of the earth's surface corresponding to at least part of the NWP data.

97. (Previously Presented) A method according to claim 95 wherein said directly observed meteorological data is derived as a data set relating to a region of the earth's surface corresponding to at least part of the NWP data.

98. (Previously Presented) A method as claimed in claim 91 wherein said region is substantially global.

99. (Previously Presented) A method as claimed in claim 92 wherein said region is substantially global.

100. (Previously Presented) A method as claimed in claim 95 wherein said region is substantially global.

101. (Previously Presented) A method as claimed in claim 96 wherein said region is substantially global.

102. (Previously Presented) A method as claimed in claim 90 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

103. (Previously Presented) A method as claimed in claim 90 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development

104. (Previously Presented) A method as claimed in claim 91 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

105. (Previously Presented) A method as claimed in claim 92 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

106. (Previously Presented) A method as claimed in claim 94 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the

earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

107. (Previously Presented) A method as claimed in claim 96 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

108. (Previously Presented) A method as claimed in claim 98 comprising predicting accurate tropospheric delay values for one or more times in the future from said meteorological information and developing a prediction set of delay value modifications for said geographic region of the earth's surface, whereby each member of said prediction set describes a delay value modification that becomes current as a function of time from development.

109. (Currently Amended) A method according to ~~anyone of the preceding~~ claim[[s]] 63 whereby the set of tropospheric delay value modifications is communicated to said receiver on a communication channel or data link.

110. (Previously Presented) A method as claimed in claim 109 comprising communicating said prediction set of delay value modifications as a batch and using members of the set as the time for which each was predicted becomes current in respect of the forecast.

111. (Previously Presented) A method as claimed in claim 102 comprising communicating said prediction set of delay value modifications as a batch and using members of the set as the time for which each was predicted becomes current in respect of the forecast.

112. (Previously Presented) A method according to claim 63 comprising communicating at least part of the set of delay value modifications to at least one orbiting satellite (101_1, 102_2, ...) and re-transmitting at least part of said set to said receiver from a said orbiting satellite.

113. (Previously Presented) A method according to claim 63 wherein only that part of the set of delay value modifications that can be of use to a receiver in a region within range of a satellite (101_1, 102_2, ...) is communicated to said satellite.

114. (Previously Presented) A method according to claim 84 comprising applying data reduction sufficient to permit transmission of all or part of said set of delay value modifications useable by said receiver within a time dictated by transmission availability and transmission rate of the satellite, said time being substantially lower than the validity time of the meteorological information used by the meteorological model.

115. (Previously Presented) A method according to claim 114 wherein the data reduction is arranged to permit delay value modification data transmission to a receiver at a data rate in the range 25 to 500 bit/s.

116. (Previously Presented) A method according to claim 115 wherein the data reduction is arranged to permit delay value modification data transmission in the range 200 to 250 bits/s.

117. (Currently Amended) An apparatus adapted to ~~carry out the method of claims 63-116~~obtain tropospheric delay data comprising:

a first set of approximate tropospheric delay values applicable to at least one remote receiver and a first model, the receivers are positioned at various geographical locations remote from the first model;

a second set of accurate tropospheric delay values applicable to said various receiver geographical locations from a second ~~meteorological~~ model, which is a meteorological model, at a location remote from said receiver;

a set of tropospheric delay value modifications applicable to said first model so that together, said first model and said tropospheric delay value modifications can provide a set of tropospheric delay values substantially in agreement with said second set of accurate tropospheric delay values; and

at least one of a communication channel and a data link for communicating said set of tropospheric delay value modifications to said receiver.

118. (Currently Amended) A method of reducing tropospheric delay errors in a global navigation satellite system (GNSS) ~~(100)~~ comprising the steps of:

generating a first set of approximate tropospheric delay values from a first model applicable to signals received from a plurality of ~~said~~ satellites ~~(101_1, 102_2, ...)~~;

receiving a set of tropospheric delay value modifications ~~previously~~ derived from a second ~~meteorological~~ model, which is a meteorological model; and

correcting the first set of approximate tropospheric delay values in accordance with the set of tropospheric delay value modifications.

119. (Previously Presented) A method according to claim 118 wherein the method is employed to more accurately determine the position of the receiver, said method including the further steps of computing an approximate position of the receiver relative to earth's surface after the step of generating the first set of approximate tropospheric delay values, and then computing an accurate location of the receiver after the step of correcting the first set of tropospheric delay values in accordance with the set of tropospheric delay value modifications.

120. (Currently Amended) A global navigation satellite system (GNSS) receiver which can compute, with greater accuracy, the location of said receiver, or the current time, said receiver comprising:

means operable to generate a first set of approximate tropospheric delay values applicable to signals received from a plurality of said satellites and compute an approximate position of the receiver relative to earth's surface or time, characterized in that the receiver also comprises;

means operable to receive a set of tropospheric delay value modifications ~~previously~~ derived from meteorological data,

means to correct the first set of approximate tropospheric delay values in accordance with the set of tropospheric delay value modifications; and

means to compute the location of the receiver or the time.

121. (Previously Presented) A receiver as claimed in claim 120 wherein said means to correct the first set of approximate tropospheric delay values is operable to effect one of interpolation and extrapolation of said modifications according to the computed position of the user relative to locations for which the modifications have been derived.

122. (Currently Amended) A receiver adapted for correcting tropospheric delay errors in a global navigation satellite system (GNSS) ~~(100) which generates~~ comprising: a receiver configured to generate a first set of approximate tropospheric delay values from a first model ~~(130)~~ applicable to signals received from a plurality of ~~said~~ satellites, wherein the satellite receiver ~~(101_1, 102_2, ...) characterized in that the receiver,~~ receives a set of tropospheric delay value modifications ~~previously~~ derived from a second ~~meteorological~~ model, which is a meteorological model; and

corrects the first set of approximate tropospheric delay values in accordance with the set of tropospheric delay value modifications.

123. (Previously Presented) A receiver according to claim 122 wherein the receiver can determine its location more accurately by computing an approximate position of the receiver

relative to earth's surface after the step of generating the first set of approximate tropospheric delay values, and then computing an accurate location of the receiver after the step of correcting the first set of tropospheric delay values in accordance with the set of tropospheric delay value modifications.